

Recap on Mix design of concrete

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Prompt

List down the 5 properties of concrete ingredients needed in mix design of concrete. Explain each one briefly how it will be used in mix design (2-3 short sentences)

Answer

1. Specific weight of the cement and coarse and fine aggregates
 - a. The specific gravity of the cement and the coarse and fine aggregates are used to determine the weight of the cement and the coarse and fine aggregates that corresponds to the volume calculated in the absolute volume method. Take note that the specific gravity of a dry rodded coarse aggregate is different from the specific gravity of a dry coarse aggregate.
2. Absorption of aggregates
 - a. The absorption of aggregates is used to control how much water is no longer necessary to add. Assuming that this value is zero would make the concrete have less water than expected, which may cause the slump of the concrete to be too short.
3. Moisture content of aggregates
 - a. This value determines the amount of moisture that is already in the aggregate, thus telling us how much water is no longer necessary to add. Failure to measure this property could make concrete that is weaker than expected.
4. Fineness modulus of fine aggregates
 - a. This value determines the amount of coarse aggregate that would be added. Although we would have an idea of the amount of coarse aggregate that would be added simply from the maximum size of the aggregates, the fineness modulus of fine aggregates would be able to refine the guess.
5. Unit weight of dry rodded coarse aggregate
 - a. This value is important in determining the amount of coarse aggregate that would be added. Without knowing this value, it is easy to guess that we would use the specific gravity of the dry (not rodded) coarse aggregates instead and thus, making the concrete poorly graded.